2000-01 BRAKES Disc & Drum - Trucks - Except Tracker

### 2000-01 BRAKES

# Disc & Drum - Trucks - Except Tracker

## MODEL IDENTIFICATION

Vehicle model can be identified by fifth character of Vehicle Identification Number (VIN), stamped on metal pad on top of left end of instrument panel, near windshield. See **MODEL IDENTIFICATION** table.

# **MODEL IDENTIFICATION**

Series (1)	Model
"A"	2WD Aztek
"B"	4WD Aztek
"C"	Silverado, Sierra, Suburban, Tahoe & Yukon
"G"	Express & Savana
"K"	Escalade, Silverado, Sierra, Suburban, Tahoe & Yukon
"L"	AWD Astro & Safari
"M"	2WD Astro & Safari
"S"	2WD Blazer, Envoy, Jimmy, S10 & Sonoma
"T"	4WD Blazer, Bravada, Envoy, Jimmy, S10 & Sonoma
"U"	Silhouette, Montana & Venture
(1) Vehicle series is fifth character of VIN.	

# **DESCRIPTION & OPERATION**

NOTE: This article covers base brake systems only. For information on

Anti-Lock Brake System (ABS) see appropriate ANTI-LOCK

article.

# **BRAKE SHOE ASSEMBLY**

Some "U" series vehicles are equipped with leading/trailing brakes, identified by adjuster screw hole in backing plate, located above horizontal centerline of rear axle. All other models are equipped with dual-servo brakes, identified by adjuster screw hole at bottom of backing plate.

Brake assembly consists of backing plate, brake shoes, return springs, automatic adjusting assembly and a wheel cylinder.

Automatic adjusting assembly consists of an actuator lever, return spring, actuator link, adjusting screw and spring. Automatic adjustment is accomplished through movement of

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actuating lever and secondary shoe.

### **BRAKE WARNING LIGHT**

#### Aztek

Brake warning light is energized when ignition is on and parking brake is applied. If brake fluid level is low, a low brake fluid level indicator is displayed on message center.

### Montana, Silhouette & Venture

Brake warning light is energized when ignition is on and parking brake is applied, or when master cylinder fluid level is low. Brake warning light is not energized if hydraulic pressure is lost; system is not equipped with pressure differential switch.

### Except Aztek, Montana, Silhouette & Venture

Pressure differential warning switch in combination valve energizes brake warning light on instrument panel when front or rear brakes lose hydraulic pressure. After repairing failed side of hydraulic system, depress brake pedal with moderate to heavy pressure to hydraulically center the piston. This will turn off brake warning light. On vehicles with Hydro-Boost, insufficient flow of power steering fluid to the hydraulic booster system will turn on brake warning light.

### **CALIPERS**

Front brakes are single piston caliper or dual piston caliper design. See <u>Fig. 11</u> and <u>Fig. 12</u>. Rear brakes are sliding caliper design. Caliper is attached to caliper mount. Caliper is mounted to steering knuckle or caliper adapter, depending on application. Caliper assembly slides back and forth in machined cutouts.

### HYDRAULIC CONTROL VALVES

## **Dynamic Rear Proportioning (Aztek)**

Dynamic Rear Proportioning (DRP) is a control system that replaces hydraulic proportioning function of mechanical proportioning valve in base brake system. DRP control system is part of operation software in EBCM. DRP uses active control with existing ABS in order to regulate vehicle's rear brake pressure.

### Combination Valve (Except Aztek, Montana, Silhouette & Venture)

System uses a combination valve to regulate brake system hydraulic pressure. Combination valve, located in brake lines between master cylinder and wheels, has 3 pressure control functions:

• Metering (or hold-off) section of valve limits pressure to front brakes until pressure of

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rear brake shoe retractor springs is overcome, then allows pressure to front brakes.

- Warning switch section of valve constantly compares front and rear brake pressures from master cylinder. See **BRAKE WARNING LIGHT** under DESCRIPTION & OPERATION.
- Proportioning section of valve allows input pressure to rise to predetermined level before allowing output pressure to rear brakes. This prevents rear wheel lock-up on vehicles with light rear wheel loads.

Combination valve also contains a by-pass feature. This ensures full system pressure is applied to rear brakes if front brakes lose hydraulic pressure (or if rear brakes lose hydraulic pressure, full pressure is applied to front brakes).

## Proportioning Valves (Montana, Silhouette & Venture)

System uses 2 proportioning valves, threaded into master cylinder, to regulate brake system hydraulic pressure.

Valves allow input pressure to rise to predetermined level before allowing output pressure to rear brakes. This prevents rear wheel lock-up on vehicles with light rear wheel loads. Valves also incorporate a by-pass feature which ensures full system pressure is applied to rear brakes if front brakes lose hydraulic pressure (or if rear brakes lose hydraulic pressure, full pressure is applied to front brakes).

# **BLEEDING BRAKE SYSTEM**

# NOTE:

The following bleeding procedures apply to all vehicles except model year 2000 Montana, Silhouette and Venture FWD vans. Manufacturer recommends using Tech 1 bleeding procedure. See ANTI-LOCK - FWD VAN article. On vehicles with Hydro-Boost, check for air bubbles in power steering fluid reservoir. If air bubbles are present, bleed Hydro-Boost system before bleeding brake system. See POWER BRAKE BOOSTER - BENDIX HYDRO-BOOST article.

# MASTER CYLINDER BLEEDING

# NOTE: To prevent air from entering brake system, bench bleed master cylinder before installing.

- 1. Place master cylinder in soft-jaw vise with front end tilted slightly down. DO NOT overtighten vise. Plug both outlet ports of master cylinder. Fill master cylinder reservoir.
- 2. Press and release piston about 1" (25 mm) several times. As air is bled from master cylinder, the primary piston will not travel the full 1" (25 mm) stroke.

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- 3. Repeat previous step with front end of master cylinder tilted slightly up. Reposition master cylinder in vise to level position. Loosen front outlet plug and push piston into bore to expel air from cylinder. Tighten plug and allow piston to return to original position. Repeat procedure at rear outlet plug.
- 4. Fill reservoir and install master cylinder. DO NOT fully tighten brake lines at this time. Slowly press brake pedal to floor and hold. Tighten brake lines. Release brake pedal. Bleed brake system. See **MANUAL BLEEDING** or **PRESSURE BLEEDING**.

### MANUAL BLEEDING

NOTE: Air tends to cling to caliper walls. When bleeding vehicles with disc brakes, lightly tap caliper to help remove air.

- 1. Deplete vacuum reserve from power brake booster by depressing brake pedal several times with engine off. Fill master cylinder and keep at least three quarters full during bleeding procedure. If master cylinder is not known or suspected to have air in bore, go to step 4. If master cylinder is known or suspected to have air in bore, go to next step.
- 2. Disconnect forward brakeline fitting at master cylinder. Allow fluid to flow from fitting. Tighten fitting to specification. See **TORQUE SPECIFICATIONS**. Have an assistant depress brake pedal slowly and hold. Loosen forward fitting. Tighten fitting while pedal is still at floor. Release brake pedal slowly. Wait 15 seconds.

NOTE: Rapid pumping of brake pedal causes master cylinder secondary piston to move into a position that makes bleeding system difficult.

3. Repeat step 2, including 15 second wait, until fluid is clear and free of air bubbles. Repeat procedure at other (rearmost) brakeline fitting on master cylinder. Master cylinder is now bled. If wheel cylinders/calipers are not suspected to have air in them, it is not necessary to bleed them.

NOTE: On vehicles with 4WAL, if brake pressure modulator valve was replaced, or is suspected to have air trapped inside, it must be bled next. See appropriate ANTI-LOCK article.

- 4. If wheel cylinders/calipers are known or suspected to have air in them, raise and support vehicle. Remove bleeder valve cap from right rear wheel. Place proper size box end wrench over bleeder valve. Attach one end of clear tube over valve and submerge other end in container partially filled with clean brake fluid.
- 5. Have an assistant depress brake pedal slowly and hold. Loosen bleeder valve to purge air from cylinder. Tighten bleeder valve and slowly release brake pedal. Wait 15 seconds. Repeat sequence, including 15 second wait, until all air is removed.
- 6. Remove tube and wrench. Repeat step 5 at left rear, right front, and left front wheels in

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this order. Fill master cylinder reservoir, and install cover. Ensure there is no sponginess in brake pedal and that BRAKE warning light is off.

## PRESSURE BLEEDING

NOTE: Air tends to cling to caliper walls. When bleeding vehicles with disc brakes, lightly tap caliper to help remove air.

WARNING: Do not use rigid clamp to position hold-off valve stem. This may damage valve assembly, causing brake failure.

1. Clean master cylinder cap and surrounding area. Remove cap. Install Brake Pressure Bleeder Adapter (J-35589-A) onto master cylinder reservoir. With pressure tank at least 2/3 full, connect pressure bleeder to master cylinder with adapters. Attach bleeder hose to right rear bleeder valve.

NOTE: On vehicles with 4WAL, if brake pressure modulator valve was replaced, or is suspected to have air trapped inside, it must be bled next. See appropriate ANTI-LOCK article.

- 2. Place other end of hose in glass jar partially filled with brake fluid so end of hose is submerged in fluid. Open release valve on pressure bleeder. Set pressure bleeder to 25-30 psi (1.75-2.11 kg/cm<sup>2</sup>) or pressure specified by equipment manufacturer.
- 3. Open bleeder screw 3/4 1 turn and note fluid flow. Close bleeder screw when no air bubbles are present in fluid flow. Repeat procedure on left rear, right front, and left front wheels in this order.
- 4. Check brake pedal operation. Remove pressure bleeder. Remove valve retainer from hold-off valve. Refill master cylinder reservoir, if necessary.

# **ADJUSTMENTS**

### **BRAKE PEDAL TRAVEL**

1. Apply brake pedal 3-5 times to deplete brake booster vacuum reserve. Using Brake Pedal Effort Gauge (J-28662) measure and record distance "A". See <u>Fig. 1</u>. Apply brake pedal with 100 lbs. (45.4 kg) of force and record distance "B". See <u>Fig. 1</u>. Release brake pedal and remeasure distance "B". Average "B" measurements and subtract distance "A" from average to obtain brake pedal travel distance. See <u>BRAKE PEDAL TRAVEL SPECIFICATIONS</u>.

# BRAKE PEDAL TRAVEL SPECIFICATIONS

Model	In. (mm)
"A", "B" & "U" Series	2.91 (74)

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"C", "G" & "K" Series	
Vacuum Assist	2.56 (65)
Hydraulic Assist	3.54 (90)
"L" & "M" Series	2.83 (72)
"S" & "T" Series	2.5 (64)

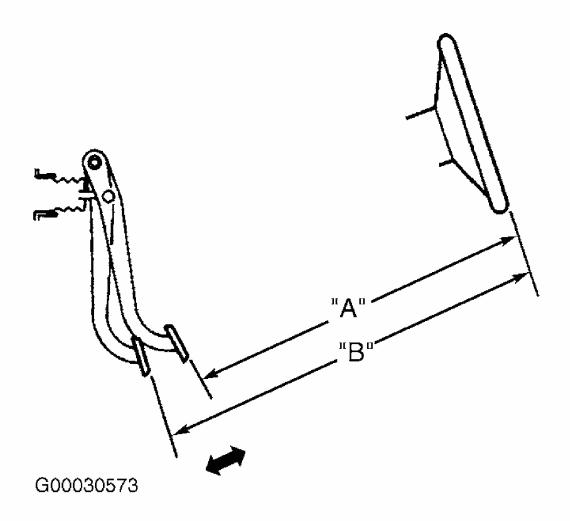


Fig. 1: Measuring Brake Pedal Travel Courtesy of GENERAL MOTORS CORP.

## **PARKING BRAKE**

NOTE: Ensure rear brake shoes are adjusted before adjusting parking brake. See <u>REAR BRAKE SHOES</u> under ADJUSTMENTS.

Aztek - (Disc)

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- 1. Apply parking brake three clicks. Raise and support vehicle. Attempt to rotate rear wheels by hand. If rear wheels exhibit drag or do not rotate, parking brake is properly adjusted. If either wheel rotates freely proceed to next step.
- 2. Adjust applicable brake lining as necessary. Adjust rear brake shoes. See **REAR BRAKE SHOES**. Tighten park brake adjuster nut until both rear wheels exhibit drag. Release parking brake. Rear wheels should rotate freely. For vehicles with rear disc, verify that park brake actuator levers have returned to their stops (full release position). If park brake levers do not return to their stops (full release position), adjust park brake shoe and lining. Lower vehicle.

## Aztek (Drum)

- 1. Apply and fully release parking brake six times. Verify that park brake pedal releases completely. Turn ON ignition. Verify that brake indicator lamp is off. If brake indicator lamp is on, then ensure that parking brake is in release mode and fully returned to stop. Check front park cable slack. Remove slack in front park brake cable by pulling downward on cable.
- 2. Raise and support vehicle. Adjust rear brake shoes. See <u>REAR BRAKE SHOES</u>. Loosen parking brake cable adjusting nut. Fully release parking brake pedal. Tighten adjusting nut until wheels will not rotate forward without excessive force. Back off adjusting nut until little or no drag exists when wheels are rotated forward. Lower vehicle.

### Astro & Safari

Raise and support vehicle. Rotate rear wheels and note amount of drag present. Tighten cable adjuster nut until rear brake shoe drag begins to increase. Lower vehicle. Apply and release parking brake lever three times. Raise vehicle. Retighten cable adjuster nut until rear brake shoe drag is present. Loosen cable adjuster nut two revolutions. Lower vehicle.

### Montana, Silhouette & Venture

- 1. Apply parking brake three clicks. Raise and support vehicle. Attempt to rotate rear wheels by hand. If rear wheels exhibit drag or do not rotate, parking brake is properly adjusted. If either wheel rotates freely proceed to next step.
- 2. Adjust rear brake shoes. See **REAR BRAKE SHOES**. Tighten park brake adjuster nut until both rear wheels exhibit drag. Release parking brake. Rear wheels should rotate freely. Lower vehicle.

"C" & "K" Series (Rear Disc)

NOTE: If parking brake pedal assembly is being replaced, ensure factory installed self adjuster lock-out pin has been removed before installing assembly.

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Remove rear brake caliper and rotor. See **REAR BRAKE ROTOR**. Using outside/inside brake shoe clearance gauge, verify parking brake shoes have a clearance of .026" (.66 mm). See **Fig. 6** and **Fig. 7**. Reinstall brake rotor. Repeat procedure for opposite side. From inside vehicle, fully apply and release parking brake 3 times to activate self-adjusting mechanism.

## **Express & Savana**

Block front wheels. Raise and support rear axle. Release parking brake. Measure exposed threads on cable adjuster. Tighten cable adjuster nut until threads measure .511" (13 mm). Verify parking brake will hold with pedal depressed. If additional adjustment is necessary, tighten cable adjuster nut in .196" (5 mm) increments until rear wheels exhibit moderate drag. Loosen cable adjuster nut until drag is not present. Verify parking brake will hold with pedal depressed. Lower vehicle.

### "S" & "T" Series

Raise and support vehicle. Loosen parking brake cable adjusting nut. Fully release parking brake pedal. Tighten adjusting nut until wheels will not rotate forward without excessive force. Back off adjusting nut until little or no drag exists when wheels are rotated forward. Lower vehicle.

### REAR BRAKE SHOES

### **Aztek**

- 1. Ensure parking brake is released. Raise and support vehicle. Remove tire and wheel. Remove brake drums. Ensure that stops on both of park brake lever is against brake shoe edges. If parking brake cable is holding stops off edge of brake shoe, adjust park brake cable.
- 2. Install Drum Brake Shoe Clearance Gauge (J-21177-A) so that it contacts inside diameter of drum. Rotate adjuster wheel and use drum brake shoe clearance gauge in order to adjust brake shoe diameter to 0.05 in" (1.27 mm) less than drum inside diameter measurement.
- 3. Install brake drum. Apply brake pedal 30-35 times with a one second pause between each brake application. Install tire and wheel. Lower vehicle. Check parking brake adjustment. See **PARKING BRAKE**.

### Montana, Silhouette & Venture

- 1. Ensure parking brake is released. Raise and support vehicle. Mark relationship of wheel and drum bearing flange. Remove rear wheels. Remove brake drums.
- 2. Install Drum Brake Shoe Clearance Gauge (J-21177-A) so that it contacts inside diameter of drum. Position clearance gauge over brake shoes. Rotate adjuster nut until shoes contact gauge.

### "G", "L", "M", "S" & "T" Series

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- 1. Raise and support vehicle. Mark relationship of wheel and drum bearing flange. Remove rear wheels. Remove brake drums.
- 2. Install Drum Brake Shoe Clearance Gauge (J-21177-A) so that it contacts inside diameter of drum. Position clearance gauge over brake shoes. Rotate adjusting screw until clearance between gauge and shoes is .02" (.5 mm). Using punch and hammer, remove knockout plug in backing plate.
- 3. Install brake drum. Tighten adjusting screw until light drag is present. Drag should be equal for both wheels. Apply brake pedal two times to center brake shoes on locating pins. Install adjusting hole cover into backing plate. Lower vehicle. Check parking brake adjustment. See **PARKING BRAKE**.

### STOPLIGHT SWITCH

NOTE: On all models, except Aztek, Montana, Silhouette and Venture, stoplight switch is installed along with brake push rod and is not adjustable.

#### **Aztek**

Insert stoplight and cruise control switch (if equipped) into brake pedal bracket. Install stoplight switch and cruise control switch (if equipped) into slotted grooves until switches are fully depresed against brake pedal, then turn switches clock-wise approximately 1/4 turn, switches should now be installed and adjusted.

### Montana, Silhouette & Venture

Depress and hold brake pedal. Push switch forward until firmly seated in retaining clip. Pull brake pedal rearward against pedal stop (clicks can be heard as switch ratchets through retaining clip). Release brake pedal. Switch is adjusted if brake lights do not come on with pedal released.

# **TESTING**

# **BRAKE WARNING LIGHT**

### **Electrical Circuit**

Disconnect wire from switch terminal on combination valve. Connect wire to ground. Turn ignition on. If brake warning light does not come on, repair brake warning light bulb or wiring circuit. If light operates, brake warning light electrical circuit is okay.

NOTE: On Astro and Safari, system is not equipped with pressure differential switch.

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- 1. Fill master cylinder reservoir. Attach bleeder hose to bleeder screw at either rear wheel. Immerse other end of hose in container of brake fluid. Turn ignition on.
- 2. While depressing brake pedal, open bleeder screw (close bleeder screw before releasing pedal). On all models except Astro and Safari, if light comes on, go to next step. If light does not come on, switch is defective; replace combination valve.
- 3. Close bleeder screw. Depress brake pedal with moderate to heavy pressure. If light goes out, switch is okay. If light stays on, switch is defective, replace combination valve. Repeat test on front brake system. System should function in same manner as rear.

# **REMOVAL & INSTALLATION**

### FRONT BRAKE CALIPER

NOTE: Replace all pads on an axle if wear indicator on any pad contacts rotor or if pad is worn to within .03" (.8 mm) of pad backing.

# Removal (Dual Piston)

- 1. Remove 2/3 of brake fluid from master cylinder. Raise and support vehicle. Remove wheel. Position "C" clamp onto caliper and tighten until piston bottoms in its bore.
- 2. Disconnect brake hose from caliper. Remove caliper guide pins. See <u>Fig. 12</u>. Remove caliper. Remove pads from caliper. Note retainer spring on inner pad (some models) and remove if replacing pads.

### Installation

- 1. Remove caliper sleeves from caliper. See <u>Fig. 12</u>. Apply silicone grease to outer diameter of caliper sleeves and inner diameter of bushings. Insert caliper sleeves into bushings.
- 2. Install retainer spring on inner pad (if removed). Install pads in caliper. Install guide pins and tighten to specification. See **TORQUE SPECIFICATIONS**.
- 3. Connect brake hose to caliper and tighten to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u>.
- 4. If outer pads are equipped with locking ears, bend ears toward caliper until ears touch caliper. This prevents movement of outer pad in caliper. See Fig. 2.

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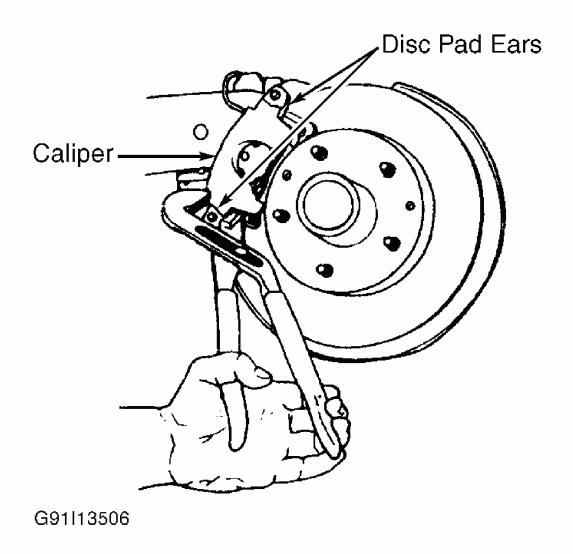


Fig. 2: Bending Outer Pad Ears Toward Caliper Courtesy of GENERAL MOTORS CORP.

# **Removal (Single Piston)**

- 1. Remove two-thirds of brake fluid from master cylinder. Raise and support vehicle. Remove wheel. Using "C" clamp or large pliers, compress caliper piston until it bottoms in its bore.
- 2. Disconnect brake hose from caliper. Remove and discard gaskets. See <u>Fig. 11</u>. Remove caliper mounting bolts. Remove caliper.

### Installation

1. Lubricate sleeves and bushings with silicone lubricant. Install NEW "O" rings to caliper. Install caliper mounting bolt sleeves. See **Fig. 11**. Install brake linings. Install

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caliper mounting bolts. On "S" & "T" models, bend outer pad ears toward caliper. See  ${\bf Fig.~2}$ .

2. To complete installation, reverse removal procedure. Tighten all fasteners to specification. See <u>TORQUE SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u>.

### FRONT BRAKE ROTOR

Removal ("C" & "K" Series)

Raise and support vehicle. Remove wheels and tires. Remove front wheel hub extension, dual rear wheels only. Remove brake caliper (DO NOT disconnect brake hose) and wire aside. See <u>FRONT BRAKE CALIPER</u>. Remove rotor retainer push nuts, if equipped. Remove rotor and hub assembly.

# Inspection

Inspect rotor lateral runout and parallelism. See <u>DISC BRAKE SPECIFICATIONS</u>. If lateral runout cannot be corrected check hub bearing for excessive lateral runout or looseness. Hub bearing assembly lateral runout cannot exceed .0016" (.040 mm).

### Installation

Align rotor to original position. To complete installation, reverse removal procedure. Tighten bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u>.

Removal ("A", "B", "G", "L", "M", "S", "T" & "U" Series)

Remove brake caliper (DO NOT disconnect brake hose) and wire aside. See <u>FRONT</u> **BRAKE CALIPER** . Remove rotor.

### Installation

Install hub and rotor assembly. To complete installation, reverse removal procedure. Tighten bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u>.

### REAR BRAKE CALIPER

NOTE: For rear disc pad removal and installation, DO NOT disconnect brake hose from caliper (wire aside). Replace all pads on an axle if wear indicator on any pad contacts rotor or if pad is worn to within .03" (.8 mm) of pad backing.

Removal ("A", "B", "C", "K" & "U" Series)

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- 1. Remove 2/3 of brake fluid from master cylinder reservoir. Raise and support vehicle. Remove wheel. Using "C" clamp, compress caliper piston until it bottoms out in its bore.
- 2. Remove brake hose from caliper. Remove and discard brake hose gaskets. Plug openings in brake caliper and brake hose in order to prevent brake fluid loss and contamination. Remove caliper guide pin bolts. Remove brake caliper.

## Removal ("S" & "T" Series)

- 1. Remove 2/3 of brake fluid from master cylinder reservoir. Raise and support vehicle. Remove wheel. Using "C" clamp, compress caliper piston until it bottoms out in its bore.
- 2. Remove brake hose from caliper. Remove caliper guide pin bolts. Remove caliper from caliper anchor bracket.

### Installation

To install, reverse removal procedure. Lubricate caliper guide pin bolts with silicon lubricant. Tighten all nuts and bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u>.

## REAR BRAKE ROTOR

# Removal

Raise and support vehicle. Remove 2/3 of brake fluid from master cylinder reservoir. Remove brake caliper, and wire aside. See **REAR BRAKE CALIPER**. Remove rotor.

### Installation

To install, reverse removal procedure. Tighten all nuts and bolts to specification. See **TORQUE SPECIFICATIONS**. Bleed brake system. See **MANUAL BLEEDING** or **PRESSURE BLEEDING**.

### REAR BRAKE DRUM

# Removal & Installation (Aztek)

- 1. Ensure parking brake is released. Raise and support vehicle. Remove tire and wheel. Mark relationship of drum to hub. Remove and discard retaining clip, if applicable. Remove brake drum. If brake drum does not come off easily, go to next step.
- 2. Loosen parking brake cable. Remove access hole plug from backing plate. Insert a flat-bladed tool through backing plate access hole in order to disengage self adjuster. Insert another flat-bladed tool through same backing plate access hole to loosen adjuster screw. Install access hole plug in order to prevent dirt or contamination from entering drum brake. Apply a small amount of penetrating oil around brake drum center hole.

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Remove brake drum. To install, reverse removal procedure. Adjust rear brake shoes. See **REAR BRAKE SHOES** under ADJUSTMENTS.

# Removal & Installation (Except Aztek, & Express & Savana With Full-Floating Axle)

Ensure parking brake is released. On Savana and Express, remove left kick panel. Place parking brake lever in full upright position. With an assistant in vehicle, raise and support vehicle. Pull rearward on front of cable strand until parking brake lever reaches its full reset position. Insert a pin into parking brake lever to hold tension. See <u>Fig. 3</u>. On all models, remove wheel. Reference mark rear brake drum-to-axle. Remove brake drum (if necessary, back off adjuster wheel before removing brake drum). To install, reverse removal procedure. Adjust rear brake shoes. See <u>REAR BRAKE SHOES</u> under ADJUSTMENTS.

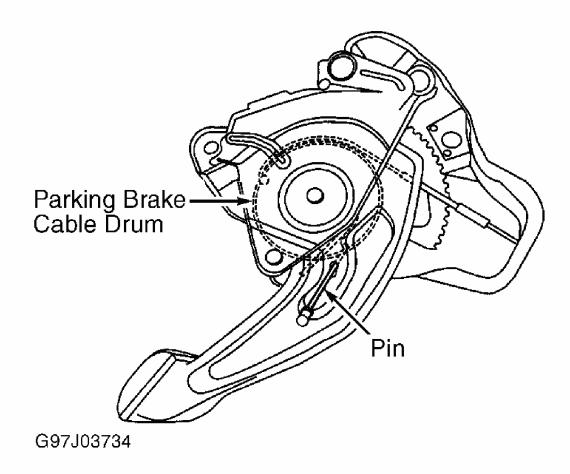


Fig. 3: Locking Parking Brake Lever (Savana & Express) Courtesy of GENERAL MOTORS CORP.

Removal (Express & Savana With Full-Floating Axle)

1. Ensure parking brake is released. Raise and support rear of vehicle. Remove wheel.

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Remove bolts from end of axle shaft. See Fig. 4.

- 2. Lightly tap axle shaft flange with soft hammer to loosen shaft. Grip rib on axle shaft flange with locking pliers. Twist axle shaft to start shaft removal. Pull axle shaft from axle housing.
- 3. Bend lock washer tab away from lock nut. Using Wheel Bearing Nut Wrench (J-2222-C), remove lock nut. Remove lock washer. Remove adjusting nut and washer. Remove hub and brake drum assembly (if necessary, back off adjuster wheel before removing brake drum).

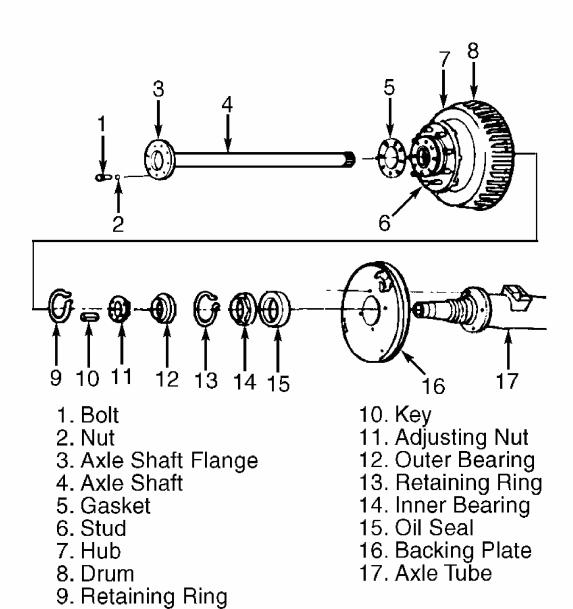


Fig. 4: Exploded View Of Rear Axle Shaft, Hub & Brake Drum Assembly (Full-

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# Floating Axle) Courtesy of GENERAL MOTORS CORP.

#### Installation

- 1. Apply light coat of bearing lubricant to axle tube. Install hub and brake drum assembly. Install washer and adjusting nut. Using Wheel Bearing Nut Wrench (J-2222-C), tighten adjusting nut to specification, while turning hub and rotor assembly. See <u>TORQUE</u> SPECIFICATIONS.
- 2. To complete installation, reverse removal procedure. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS**.

### **REAR BRAKE SHOES**

NOTE: Do not interchange left and right adjusting screw assemblies as one side is right-hand thread and other is left-hand thread.

Removal ("G", "L", "M", "S" & "T" Series)

- 1. Raise and support vehicle. Remove tire and wheel. On Express and Savana, install pin into parking brake lever. See <u>Fig. 3</u>. Remove rear brake drum. See <u>REAR BRAKE</u> **DRUM**.
- 2. Remove return springs, hold down springs and pins, and brake shoe guide. See <u>Fig. 13</u> Remove rear brake shoe actuator and link. Remove parking brake lever and strut. Remove rear brake shoe adjuster and spring. Remove brake shoes.

### Removal (Aztek, Montana, Silhouette & Venture)

- 1. Raise and support vehicle. Remove wheel and tire. Remove brake drum. See <u>REAR</u> <u>BRAKE DRUM</u>. Using Brake Shoe Spring Remover (J-38400), remove adjuster and return springs. See <u>Fig. 14</u>.
- 2. Remove primary brake shoe. Remove adjuster actuator from primary brake shoe. Remove adjuster from secondary brake shoe and park brake actuator. Remove park brake actuator from secondary brake shoe.
- 3. Using Brake Shoe Spring Remover (J-38400), remove secondary return spring. Remove secondary brake shoe.

### Installation

To install, reverse removal procedure. Lubricate backing plate and adjusting screws with silicone lubricant. Tighten nuts and bolts to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE</u> <u>BLEEDING</u>.

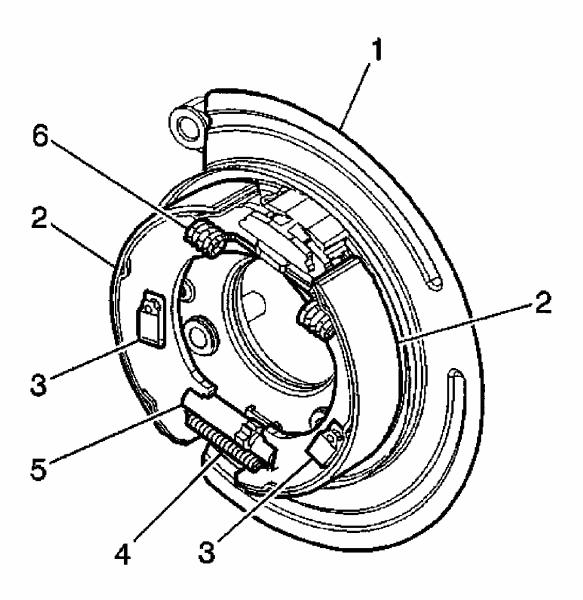
PARKING BRAKE SHOES (REAR DISC BRAKES)

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### **Removal (1500)**

- 1. Raise and support the vehicle.
- 2. Remove the tire and the wheel.
- 3. Remove the caliper and mounting bracket as an assembly.
- 4. Relieve the tension on the park brake cables by loosening the nut at the equalizer.
- 5. Remove the parking brake cable from the lever.
- 6. Remove the rotor.
- 7. Remove the rear axle shaft.
- 8. Turn the star adjuster screw (5) to the fully home position in the notched adjustment nut. See **Fig. 5**.
- 9. Remove the park brake shoe assembly by sliding the shoe (2) toward the retaining spring clip (3) until the shoe disengages from the spring clip and pin.

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- 1. Backing Plate
- 2. Parking Brake Shoes
- 3. Retaining Clips & Pins
- 4. Return Spring
- 5. Star Adjuster
- 6. Return Spring

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Fig. 5: Identifying Rear Park Brake Components (Rear Disc Brakes) Courtesy of GENERAL MOTORS CORP.

### Installation

- 1. Clean the debris and the dust from the park brake components using a clean towel.
- 2. Align the slots in both the star adjuster screw and tappet to be parallel with the backing

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plate face.

- 3. Position the park brake shoe on the inboard side of the actuator.
- 4. Slide the parking brake shoe into position and seat into the retaining spring.
- 5. Inspect the shoe assembly position.
- 6. The shoe must be central on the backing plate with both tips located in the slots.
- 7. Adjust the park brake shoe. Using outside/inside brake shoe clearance gauge, verify parking brake shoes have a clearance of .026" (.66 mm). See <u>Fig. 6</u> and <u>Fig. 7</u>.
- 8. Install the axle shaft.
- 9. Install the rotor. Install the park brake cable to the park brake lever.

# NOTE:

Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

- 10. Tighten the nut to the intermediate cable at the equalizer to 31 INCH lbs. (3.5 N.m).
- 11. Install the caliper and mounting bracket as an assembly.
- 12. Install the tire and wheel.
- 13. Remove the safety stands.
- 14. Lower the vehicle.
- 15. Adjust parking brake cable.

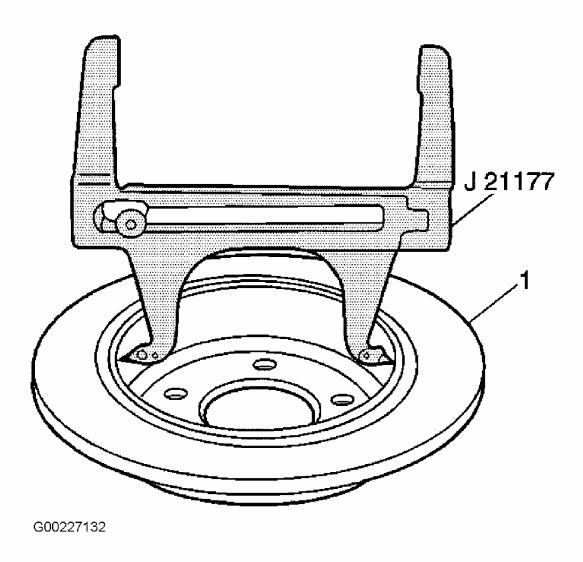


Fig. 6: Measuring Rotor Inner Park Brake Diameter Courtesy of GENERAL MOTORS CORP.

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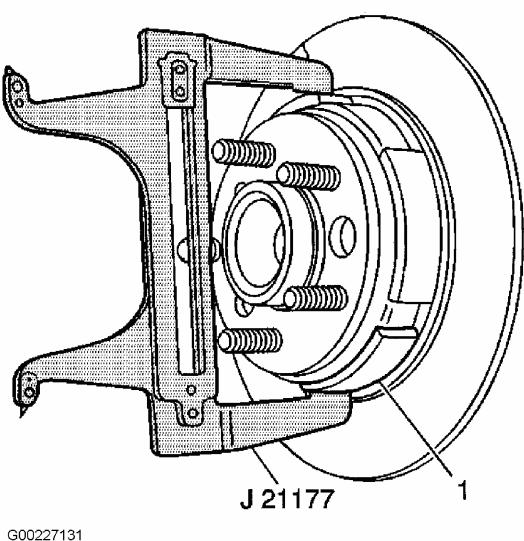


Fig. 7: Measuring Park Brake Shoe Outer Diameter (Widest Point)

### **Removal (2500)**

- 1. Raise and support the vehicle.
- 2. Remove the tire and the wheel.
- 3. Remove the caliper and mounting bracket as an assembly.
- 4. Relieve the tension on the park brake cables by loosening the nut at the equalizer.
- 5. Remove the parking brake cable from the lever.
- 6. Remove the rotor.
- 7. Remove the axle shaft. See AXLE SHAFT article in DRIVE AXLES.
- 8. Remove the park brake shoe return springs (4 and 6). See Fig. 5
- 9. Remove the park brake shoe anchor spring clips and pins (3).

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10. Remove the park brake shoes (2).

### Installation

- 1. Clean the debris and the dust from the park brake components using a clean towel.
- 2. Install the park brake shoes (2).
- 3. Install the park brake shoe anchor spring clips and pins (3).
- 4. Install the park brake shoe return springs (4 and 6).
- 5. Adjust the park brake shoe. Using outside/inside brake shoe clearance gauge, verify parking brake shoes have a clearance of .026" (.66 mm). See <u>Fig. 6</u> and <u>Fig. 7</u>.
- 6. Install the axle shaft.
- 7. Install the rotor.
- 8. Install the park brake cable to the park brake lever.

## NOTE:

Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

- 9. Tighten the nut to the intermediate cable at the equalizer. Tighten the nut to 31 INCH lbs. (3.5 N.m).
- 10. Install the caliper and mounting bracket as an assembly.
- 11. Install the tire and wheel.
- 12. Remove the safety stands.
- 13. Lower the vehicle.
- 14. Adjust parking brake cable.

### WHEEL CYLINDER

## Removal & Installation (Aztek, Montana, Silhouette and Venture)

Remove rear brake drum. See **REAR BRAKE DRUM**. Remove brake pipe. On Aztek models, install a cap over end of brake pipe in order to prevent brake fluid loss and/or brake fluid contamination. On all models, remove wheel cylinder bolts. Using Brake Shoe Spring Remover (J-38400), spread brake shoes apart. Remove wheel cylinder. To install, reverse

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removal procedure. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE</u> BLEEDING under BLEEDING BRAKE SYSTEM.

Removal & Installation ("G", "L", "M", "S" & "T" Series)

Remove rear brake shoes. See <u>REAR BRAKE SHOES</u>. Disconnect brake line from wheel cylinder. Remove brake cylinder retaining bolts and brake cylinder. To install, reverse removal procedure. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE</u> <u>BLEEDING</u> under BLEEDING BRAKE SYSTEM.

### MASTER CYLINDER

### Removal

- 1. With engine off, press brake pedal several times to release vacuum in power brake unit. Clean dirt and grease from master cylinder brake line fittings. Disconnect brake lines from master cylinder and plug line ends. On Aztek, disconnect fluid level sensor electrical connector.
- 2. On vehicles with combination valve and bracket attached to master cylinder mounting studs, remove combination valve and bracket. On vehicles without power brake unit, disconnect brake pedal push rod at brake pedal. On all vehicles, remove master cylinder retaining nuts and master cylinder.

### Installation

- 1. Bench bleed master cylinder before installing. See **MASTER CYLINDER BLEEDING** under BLEEDING BRAKE SYSTEM. Position master cylinder on mounting studs. Position combination valve and bracket on mounting studs (if applicable). Loosely install master cylinder retaining nuts. Connect brake lines to master cylinder but DO NOT tighten.
- 2. Tighten master cylinder retaining nuts. On Aztek, connect fluid level sensor electrical connector. Tighten brake lines. See **TORQUE SPECIFICATIONS**. Connect brake pedal push rod (if disconnected). Fill fluid reservoir. Bleed brake system. See **MANUAL BLEEDING** or **PRESSURE BLEEDING**.

### POWER BRAKE BOOSTER

### Removal (Aztek)

- 1. Remove air cleaner and duct. Remove vacuum hose from check valve. Reposition vacuum hose. Remove throttle cables from throttle body and bracket. Remove heater inlet pipe. Remove fuel lines from pipes and vapor line.
- 2. Remove ABS hydraulic modulator/master cylinder. Remove EGR tube. Remove exhaust crossover. Remove transmission fluid filler tube. Remove left side instrument panel insulator.

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NOTE: When disconnecting pushrod from brake pedal, brake pedal must be held staionary or damage to brake switch may result.

3. Remove knee bolster. Disable SIR system. Remove booster push rod retaining clip and washer from brake pedal asembly. Remove brake booster push rod from brake pedal. Remove master cylinder/ABS modulator. Remove mounting nuts and brake booster.

### Installation

CAUTION: When replacing power booster brake, ensure that cruise control cable is not routed between booster and cowl. If cable is damaged or pinched, it must be replaced. Failure to do this could result in personal injury.

To install, reverse removal procedure. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS**. Bleed brake system if lines were disconnected from master cylinder. See **MANUAL BLEEDING** or **PRESSURE BLEEDING** under BLEEDING BRAKE SYSTEM.

Removal & Installation (Except Aztek)

# NOTE: For Hydro-Boost removal and installation. See POWER BRAKE BOOSTER - BENDIX HYDRO-BOOST article.

- 1. Remove master cylinder. See **MASTER CYLINDER**. Ensure no brake fluid contacts ABS control unit or related electrical connectors and wiring.
- 2. Disconnect vacuum hose from booster. Disconnect booster push rod from brake pedal. Remove booster mounting nuts from inside vehicle. Remove booster and gasket.
- 3. To install, reverse removal procedure. On Savana and Express, tighten booster retaining nuts to specification in a cross pattern using following procedure. Tighten right lower, left upper, left lower and then right upper retaining nut. Bleed brake system if lines were disconnected from master cylinder. See **MANUAL BLEEDING** or **PRESSURE BLEEDING** under BLEEDING BRAKE SYSTEM.

### **COMBINATION VALVE**

### Removal (Astro & Safari)

Raise and support vehicle. Disconnect brake warning light electrical connector from combination valve switch. Disconnect brake lines from valve. Cap brake line ends. Remove valve mounting bolts. Remove valve.

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To install, reverse removal procedure. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u> under BLEEDING BRAKE SYSTEM. Center the brake warning light switch piston by applying moderate to heavy force on brake pedal.

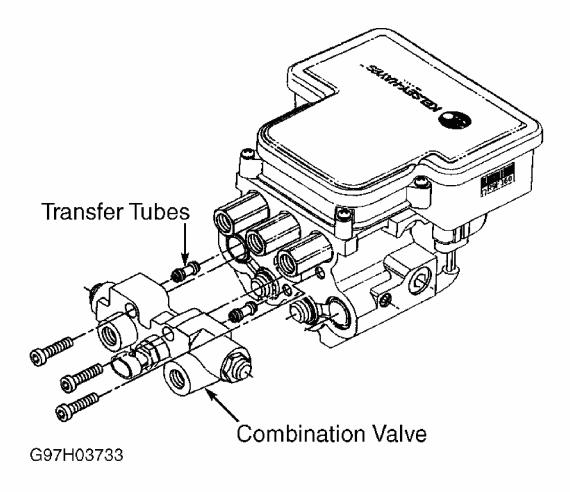
### Removal (Express & Savana)

Raise and support vehicle. Remove combination valve shield. Disconnect electrical connector from combination valve. Disconnect front and rear brake pipes. Remove combination valve from master cylinder.

#### Installation

NOTE: Install NEW transfer tubes with new combination valve. See <u>Fig.</u> 8.

To install, reverse removal procedure. Bleed brake system. See <u>MANUAL BLEEDING</u> or <u>PRESSURE BLEEDING</u> under BLEEDING BRAKE SYSTEM. Center the brake warning light switch piston by applying moderate to heavy force on brake pedal.



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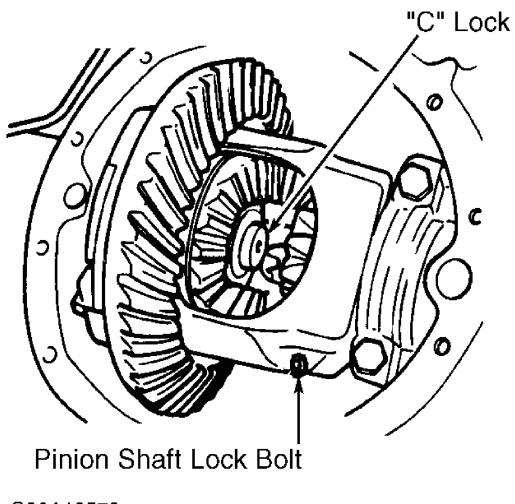
# Fig. 8: Exploded View Of Combination Valve (Express & Savana) Courtesy of GENERAL MOTORS CORP.

# REAR AXLE BEARING & OIL SEAL (SEMI-FLOATING AXLE)

Removal ("L", "M", S" & "T" Series)

- 1. Raise and support vehicle. Remove wheels and brake drums, if equipped. Loosen differential cover plate and drain lubricant from axle. Remove cover plate.
- 2. Remove pinion shaft lock bolt. See <u>Fig. 9</u> and <u>Fig. 10</u>. Remove pinion shaft. Push axle shaft toward center of vehicle and remove "C" lock from end of axle shaft. Remove axle shaft.
- 3. Pry seal from axle housing. Using slide hammer and axle bearing puller, remove bearing from axle housing.

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Fig. 9: Locating "C" Lock & Pinion Shaft Lock Bolt (Astro, Safari, & "S" & "T" Series Shown; Others Similar)
Courtesy of GENERAL MOTORS CORP.

### Installation

- 1. Lubricate bearing with gear lubricant. Using handle and bearing installer, install bearing in axle housing until bearing installer bottoms against shoulder of axle housing.
- 2. Using seal installer, install seal until even with surface of axle housing. Lubricate seal lips with gear lubricant. Install axle shaft and "C" lock. See <u>Fig. 9</u> and <u>Fig. 10</u>. Pull axle shaft outward to ensure "C" lock seats in side gear.
- 3. Install pinion shaft. Install NEW pinion shaft lock bolt. Tighten lock bolt to 25 ft. lbs. (34 N.m). Install differential cover and new gasket. Fill drive axle with gear lubricant.

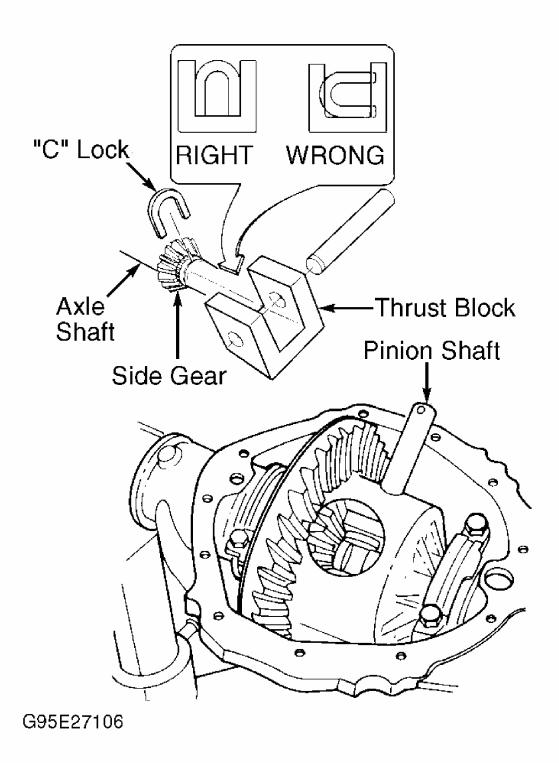


Fig. 10: Removing & Installing "C" Lock & Pinion Shaft On Locking Differential (Typical)
Courtesy of GENERAL MOTORS CORP.

Removal (Except "L", "M", S" & "T" Series)

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- 1. Raise and support vehicle. Remove wheel and brake drum. Loosen differential cover plate and drain lubricant from axle. Remove cover plate. Remove pinion shaft lock bolt. See <u>Fig. 9</u> and <u>Fig. 10</u>.
- 2. On locking differential models, remove pinion shaft part way. Rotate differential case until pinion shaft contacts axle housing. Using screwdriver, rotate "C" lock until it aligns with thrust block. On all models, push axle shaft toward center of vehicle and remove "C" lock from end of axle shaft.
- 3. Remove axle shaft from axle housing. Using seal remover, remove seal from axle housing. Remove bearing using slide hammer and bearing puller.

### Installation

- 1. Lubricate bearing and seal lips with wheel bearing grease. Fill axle cavity between seal and axle with wheel bearing grease.
- 2. Using Bearing Installer (J-23690) on 8 1/2" and 8 5/8" ring gear or (J-29709) on 9 1/2" ring gear, install bearing until installer contacts axle housing. Using Seal Installer (J-21128) on 8 1/2" and 8 5/8" ring gear or (J-29713) on 9 1/2" ring gear, install seal until even with axle housing.
- 3. Install axle shaft. DO NOT damage seal. Ensure splines on axle shaft engage with splines on side gear. To install remaining components, reverse removal procedure. Ensure "C" lock is fully seated or positioned in thrust block. See Fig. 9 and Fig. 10.
- 4. Install pinion shaft. Apply Loctite No. 242 to pinion shaft lock bolt threads and tighten to specifications. See **TORQUE SPECIFICATIONS**. Install differential cover and new gasket. Fill axle with gear lubricant.

## REAR AXLE HUB BEARINGS & OIL SEAL (FULL-FLOATING AXLE)

NOTE: Outer bearing race is seated against a retaining ring inside hub, on inboard side of race. Remove retaining ring from inside of hub before driving out race.

### Removal

- 1. Remove rear hub and rotor assembly. See **REAR BRAKE ROTOR** . Using a long drift and hammer, drive out inner bearing race, inner bearing and oil seal from outboard to inboard side of hub.
- 2. Remove retaining ring from inside of hub, inboard of outer bearing. Using handle and outer bearing race remover/installer, drive out outer bearing race from outboard to inboard side of hub.

# Installation

1. Clean and pack bearings with wheel bearing lubricant. Using handle and bearing race installer, drive outer wheel bearing race into hub from inboard side of hub (ensure

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- chamfered edge of bearing race installer is facing upward so that it does not contact bearing race).
- 2. Install retaining ring on inboard side of outer bearing race. Turn hub and rotor assembly inboard side down. Using outer bearing race remover/installer, seat outer bearing race against retaining ring.
- 3. Using inner bearing race remover/installer, drive inner bearing race into hub from inboard side of hub. Install inner bearing. Install new oil seal using axle shaft seal installer.
- 4. To complete installation, reverse removal procedure. To adjust wheel bearings, see **REAR BRAKE ROTOR**.

# **OVERHAUL**

NOTE: Use exploded view illustrations for overhaul of brake assemblies. See Fig. 11 -Fig. 20.

WARNING: Do not hone master cylinder bore. Honing destroys hardened surface, causing premature piston seal failure. If bore surface is rough or pitted, replace master cylinder.

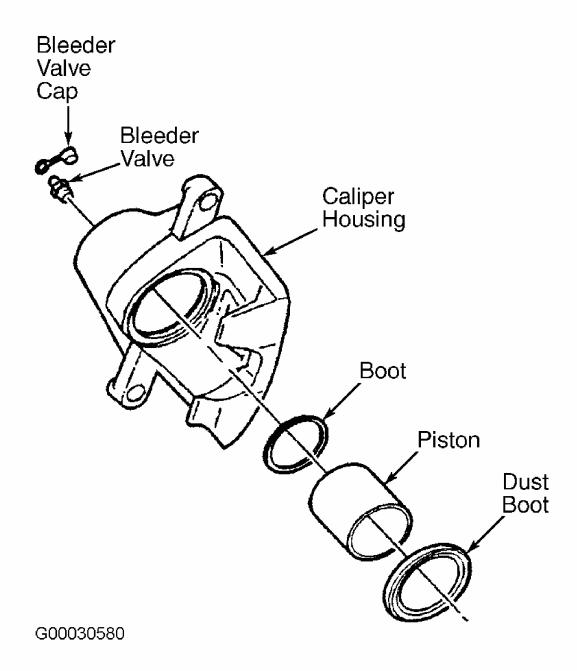


Fig. 11: Exploded View Of Single Piston Caliper Assembly (Typical) Courtesy of GENERAL MOTORS CORP.

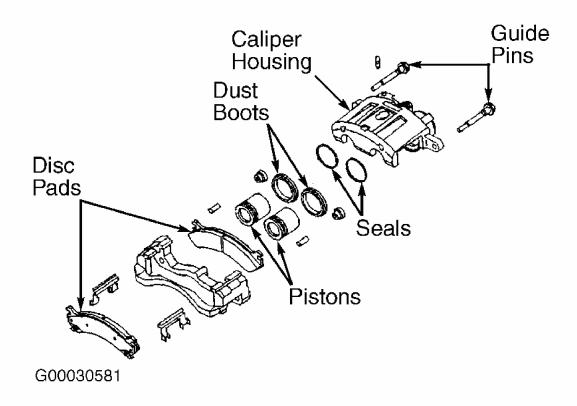


Fig. 12: Exploded View Of Dual Piston Caliper Assembly (Typical) Courtesy of GENERAL MOTORS CORP.

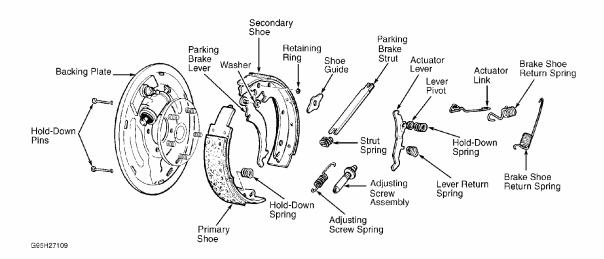


Fig. 13: Exploded View Of Rear Brake Shoe Assembly (Except, Montana, Silhouette & Venture)
Courtesy of GENERAL MOTORS CORP.

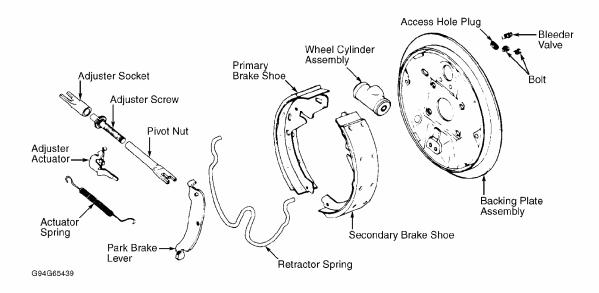


Fig. 14: Exploded View Of Rear Brake Shoe Assembly (Montana, Silhouette & Venture)
Courtesy of GENERAL MOTORS CORP.

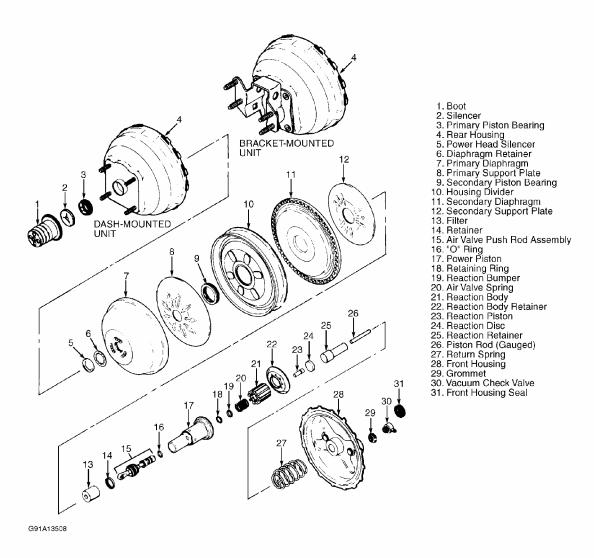
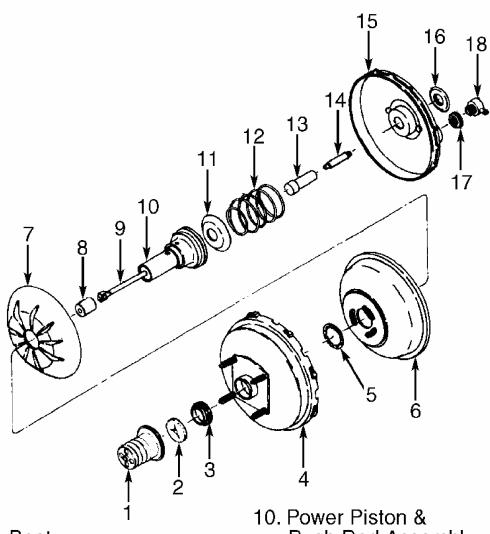


Fig. 15: Exploded View Of Power Brake Booster (Dual Diaphragm) Courtesy of GENERAL MOTORS CORP.

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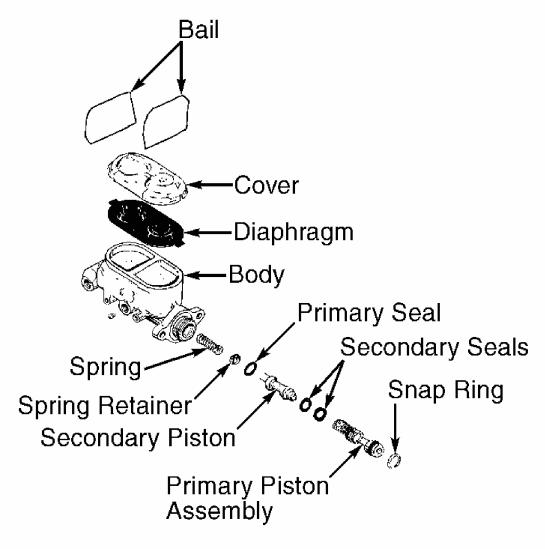


- 1. Boot
- 2. Silencer
- 3. Power Piston Bearing
- 4. Rear Housing
- 5. Diaphragm Retainer
- 6. Diaphragm
- 7. Diaphragm Support
- 8. Filter
- 9. Push Rod

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- Push Rod Assembly
- 11. Reaction Body Retainer
- 12. Return Spring
- 13. Reaction Retainer
- 14. Piston Rod (Gauged)
- 15. Front Housing
- 16. Front Housing Seal
- 17. Grommet
- 18. Vacuum Check Valve

Fig. 16: Exploded View Of Power Brake Booster (Single Diaphragm) Courtesy of GENERAL MOTORS CORP.



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Fig. 17: Exploded View Of Cast Iron Master Cylinder Courtesy of GENERAL MOTORS CORP.

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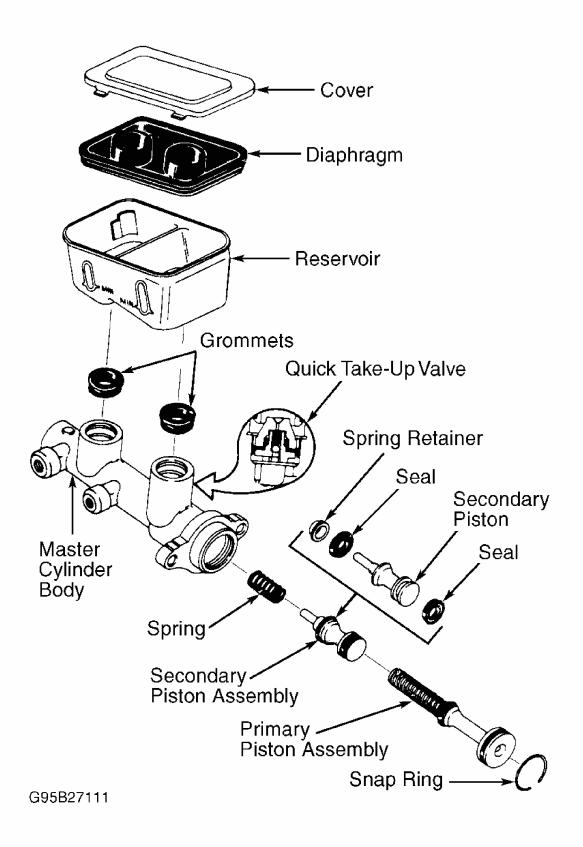
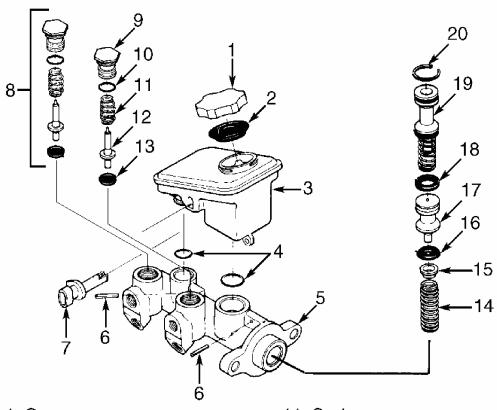


Fig. 18: Exploded View Of Composite Master Cylinder (Except Montana, Silhouette & Venture)

Courtesy of GENERAL MOTORS CORP.

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- 1. Cap
- 2. Diaphragm
- 3. Reservoir
- 4. "O" Ring
- 5. Body
- 6. Spring Pin
- 7. Fluid Level Sensor
- 8. Proportional Valve Assembly
- 9. Proportional Valve Cap
- 10. "O" Ring

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- 11. Spring
- 12. Proportional Valve Piston
- 13. Proportional Valve Seal
- 14. Spring
- 15. Spring Retainer
- 16. Primary Seal
- 17. Secondary Piston
- 18. Secondary Seal
- 19. Primary Piston Assembly
- 20. Retainer

Fig. 19: Exploded View Of Composite Master Cylinder (Montana, Silhouette & Venture)

**Courtesy of GENERAL MOTORS CORP.** 

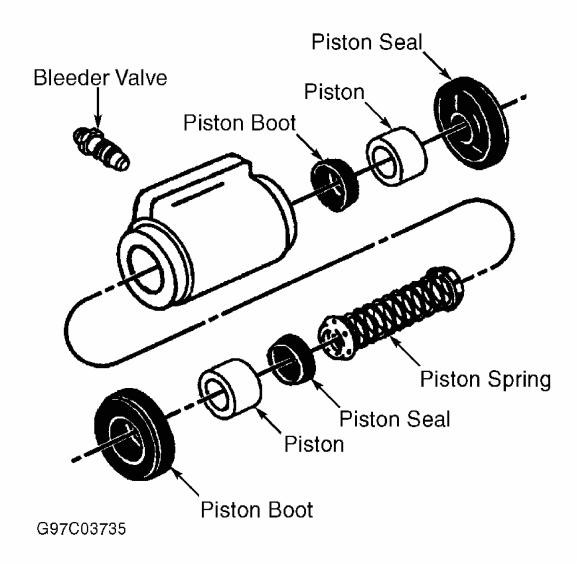


Fig. 20: Exploded View Of Rear Wheel Cylinder (Typical) Courtesy of GENERAL MOTORS CORP.

# **DRUM BRAKE SPECIFICATIONS**

# **DRUM BRAKE SPECIFICATIONS**

Application	In. (mm)
Astro, Safari, & "S" & "T" Series	
Drum	
Original Diameter	9.50 (241.3)
Discard Diameter	9.59 (243.6)
Maximum Allowable Diameter After Refinish	9.56 (242.8)
Diameter	
Width	2.00 (50.8)

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Aztek	
Drum	
Discard Diameter	9.902 (251.5)
Maximum Allowable Diameter After Refinish Diameter	9.882 (251.0)
Allowable Radial Runout (Maximum)	.006 (.015)
Allowable Scoring (Maximum)	.06 (1.5)
Express & Savana	
Drum	
Original Diameter	
1500 & 2500 Series	11.15 (283.2)
2500 (Diesel) & 3500	13.00 (330.2)
Discard Diameter	_
11.15" Drum	11.24 (285.5)
13.00" Drum	13.09 (332.5)
Maximum Allowable Diameter After Refinish	
11.15" Drum	11.21 (284.7)
13.00" Drum	13.06 (331.7)
Width	
11.15" Drum	2.75 (69.9)
13.00" Drum	2.50 (63.5) Or 3.50
	(88.9)
Montana, Silhouette & Venture	
Drum	
Original Diameter	8.86 (225.0)
Discard Diameter	8.92 (226.6)
Maximum Allowable Diameter After Refinish Diameter	8.91 (226.3)
Wheel Cylinder Diameter	.937 (23.80)

# **DISC BRAKE SPECIFICATIONS**

# **DISC BRAKE SPECIFICATIONS**

Application	In. (mm)
Lateral Runout (All Models)	.003 (.08)
Parallelism (All Models)	.0005 (.013)
Original Thickness	·
Astro & Safari	
2WD	1.04 (26.4)

l AWD	1.25 (31.75)
Aztek	1120 (0 211.0)
Front	1.18 (30.0)
Rear	.43 (11.0)
"C" & "K" Series	,
Front	
1500 Series	1.14 (29)
2500 & 3500 Series	1.50 (38)
Rear	,
8 5/8" Ring Gear	.787 (20)
9 1/2" Ring Gear & 10 1/2" Ring Gear	1.14 (29)
11 1/2" Ring Gear	1.18 (30)
Express & Savana	
1500 & 2500 (Light Duty)	1.25 (31.75)
2500 (Gasoline Engine)	1.26 (32.0)
2500 (Diesel) & 3500	1.5 (38.1)
Montana, Silhouette,& Venture	1.27 (32.2)
"S" & "T" Series	1.03 (26.2)
Front	
Single Piston	1.03 (26.2)
Dual Piston	1.14 (29)
Rear	.787 (20)
Minimum Refinish Thickness (1)	
Astro, Safari	
2WD	.980 (24.89)
AWD	1.23 (31.2)
Aztek	
Front	1.125 (28.58)
Rear	.41 (10.6)
"C" & "K" Series	
Front	
1500 & 2500 Series	1.1 (28)
3500 Series	1.46 (37)
Rear	
8 5/8" Ring Gear	.748 (19)
9 1/2" & 10 1/2" Ring Gear	1.1 (28)
11 1/2" Ring Gear	1.142 (29)
Express & Savana	
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	1.23 (31.24)
2500 (Diesel) & 3500 Series	1.48 (37.59)
Montana, Silhouette & Venture	1.25 (31.8)
"S" & "T" Series	
Front	
Single Piston	.98 (24.89)
Dual Piston	1.13 (28.7)
Rear	.735 (18.67)
Discard Thickness	·
Astro, Safari	
2WD	.965 (24.51)
AWD	1.215 (30.86)
Aztek	
Front	1.063 (27.0)
Rear	.35 (9.0)
"C" & "K" Series	
Front	
1500	1.082 (27.50)
2500 & 3500	1.437 (36.50)
Rear	
8 5/8" Ring Gear	.728 (18.5)
9 1/2" & 10 1/2" Ring Gear	1.082 (27.5)
11 1/2" Ring Gear	1.122 (28.5)
Express & Savana	
1500 & 2500	1.215 (30.86)
2500 (Diesel) & 3500	1.465 (37.21)
Montana, Silhouette & Venture	1.21 (30.7)
"S" & "T" Series	.965 (24.51)
Front	
Single Piston	.965 (24.51)
Dual Piston	1.08 (27.4)
Rear	.728 (18.5)
(1) Use specification stamped on rotor (if available)	

# **TORQUE SPECIFICATIONS**

**TORQUE SPECIFICATIONS** 

Application	Ft. Lbs. (N.m)

Axle Shaft-To-Hub Bolt	52 (71)
Backing Plate Bolts	103 (140)
"C" & "K" Series	100 (136)
"L", "M", & "S" & "T" Series	35 (47)
Brake Cylinder Bolts	13 (18)
Brake Line Fittings	
"A", "B" & "U" Series	15 (20)
"C", "G" & "K" Series	18 (24)
"L", "M", & "S" & "T" Series	13 (18)
Brake Line Fittings-To-EBCM	15 (20)
Brake Hose-To-Front Brake Caliper	
"A", "B" & "U" Series	40 (54)
"C", "G" & "K" Series	38 (52)
"L", "M", & "S" & "T" Series	32 (43)
Brake Hose-To-Rear Brake Caliper	32 (43)
"A" & "B" Series	
Brake Hose-To-Rear Brake Caliper "	C" & "K" Series
1500	35 (47)
2500 & 3500	38 (52)
Caliper Guide Pin	
"C" & "K" Series	
Front	80 (108)
Rear	
1500	31 (42)
2500 & 3500	80 (108)
"S" & "T" Series	
Front	
Single Piston	38 (52)
Dual Piston	85 (115)
Rear	23 (31)
Caliper Bolt	
Aztek	
Front	26 (35)
Rear	33 (45)
Except Aztek	38 (52)
Combination Valve Allen Bolts	12 (16)
Differential Cover Bolt	
Astro & Safari	22 (30)

"C" & "K" Series	24 (33)	
Express & Savana	30 (41)	
"S" & "T" Series		
7 5/8" Ring Gear	25 (34)	
8 5/8" Ring Gear	29 (39)	
Pinion Shaft Lock Bolt <sup>(1)</sup> (2)		
Astro & Safari	19 (26)	
"C", "G", "K", & "S" & "T" Series		
7 5/8" Ring Gear	20 (27)	
8 1/2" & 8 5/8" Ring Gear	27 (37)	
9 1/2" Ring Gear	37 (50)	
Power Booster Nuts		
"C", "G", "K", "L" & "M" Series	27 (37)	
"S" & "T" Series	30 (41)	
Montana, Silhouette & Venture	18 (24)	
Wheel Lug Nut		
"A", "B", "L", "M" & "U" Series	100 (136)	
"C", "G" & "K" Series		
Single Wheel	140 (190)	
Dual Wheel	175 (237)	
"S" & "T" Series	92 (125)	
Wheel Cylinder Bolt (Aztek)	8.9 (12)	
(1) Use NEW pinion shaft lock bolt. DO NOT reuse bolt.		
(2) On "C" and "K" series, apply Loctite No. 242 to bolt threads.		